ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 17, Issue 4, 2024

Online - 2455-3891
Print - 0974-2441

Research Article

A STUDY ON THE PREVALENCE OF OVERWEIGHT AND OBESITY AMONG WOMEN AGED 20 YEARS AND ABOVE IN RURAL FIELD PRACTICE AREA OF SIMS, HAPUR

R K SEHGAL, VISHWANATH GHOSHAL, UJJWAL SOURAV*

Department of Community Medicine, SIMS, Hapur, Uttar Pradesh, India
***Corresponding author: Ujjwal Sourav; Email: 3ujjwalsourav3@gmail.com**

Received: 21 August 2023, Revised and Accepted: 12 December 2023

ABSTRACT

Objectives: The aim of the study was to assess the prevalence of overweight as well as obesity among women aged 20 years and above in a rural covered area of SIMS, Hapur, and to assess the risk factors for overweight and obesity in the above study population.

Methods: This research was carried out in the rural field practice area of SIMS, Hapur, spanning from July 2022 to July 2023. The study focused on women aged 20 years and older who were residents of the SIMS field practice area. The following criteria were used to select the study participants: Women who were pregnant at the time of the study, those who could not be reached after two home visits, individuals taking chronic medications that might lead to weight gain, and those who were uncooperative were excluded from the study.

Results: Out of the 500 participants in the study, 18.6% were categorized as underweight, 53.6% fell within the normal weight range, and 27.8% were considered overweight. Within the group of overweight individuals, a substantial 70.5% were classified as obese. The study revealed that the overall prevalence of overweight (defined as BMI>23) was 27.7%, while the prevalence of obesity (defined as BMI>25) stood at 19.8%. Furthermore, 29.9% of the women had a waist circumference exceeding 80 cm.

Conclusion: Based on the findings from our current research, it can be deduced that women with higher levels of education and socioeconomic status, a family history of excess weight, a higher number of pregnancies, a lack of physical activity, insufficient sleep, and poor dietary choices are more likely to be at risk of becoming overweight or obese. To prevent the rising prevalence of excess fat and obesity, it is imperative to implement lifestyle and dietary modifications.

Keywords: Obesity, BMI, Sedentary, Metabolic disease.

 DOI: http://dx.doi.org/10.22159/ajpcr.2024v17i4.49182. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

The World Health Organization (WHO) has officially labeled the global prevalence of overweight and obesity as an epidemic. This is a significant public health concern, impacting not only adults but also a growing number of children and adolescents. The rapid increase in obesity can be attributed to substantial changes in dietary habits and lifestyles on a global scale. Recent data show that there are more than one billion individuals worldwide who are overweight, and approximately 300 million of them meet the criteria for obesity. What was once considered a problem associated with affluence has now spread rapidly to developing countries like India, where overweight and obesity coexist alongside issues of undernutrition. The root problem behind these challenges lies in a persistent mismatch between the calories consumed and the body's actual energy requirements [1].

In numerous developing nations, factors like urbanization, increased mechanization of work and transportation, the widespread availability of processed and fast foods, and a growing reliance on television for leisure activities have collectively led to the widespread adoption of sedentary lifestyles and the consumption of calorie-dense; yet, nutritionally poor diets. This shift has played a key role in the rapid rise in rates of overweight and obesity, contributing to the emergence of chronic health conditions such as diabetes, hypertension, cardiovascular diseases, cancer, and musculoskeletal disorders. This increase is particularly noticeable among middle-class urban populations [2].

Type 2 diabetes, also known as non-insulin dependent diabetes mellitus, are closely associated with being overweight and obese and accounts for a significant majority of diabetes cases. The World Health Organization (WHO) estimates that approximately 58% of diabetes cases, 21% of cases of ischaemic heart disease, and 8–42% of specific cancer cases can be linked to having a body mass index (BMI) higher than 21 kg/m^2. Overweight conditions have also been linked to a range of other health problems, including gallstones, liver abnormalities, low back pain, osteoarthritis in the hands and wrists, reduced lung function, airway hyperresponsiveness, asthma symptoms, and sleep apnea [3].

Metformin stands as the primary pharmacological choice for addressing Type 2 diabetes due to its minimal risk of hypoglycemia and absence of impact on body weight. Its efficacy in achieving optimal blood glucose control is key [4]. Among Asian populations, the health risks associated with excess weight emerge at lower BMI levels, urging considerations for revised thresholds. Notably, obesity is linked to various reproductive issues and complications during pregnancy, highlighting its broader impact [5]. Recent research from the European Society of Cardiology revealed that infections like COVID-19 infection trigger endothelial damage through mechanisms involving inflammation, leukocyte infiltration, thrombosis, platelet aggregation, increased reactive oxygen species, and heightened apoptosis. These findings shed light on the multifaceted effects of the virus on the body's vascular system [6].

In the past, governments in numerous developing nations, as they were primarily addressing widespread problems related to undernutrition and communicable diseases, did not place significant emphasis on addressing the issues of overweight and obesity. However, the increasing prevalence of the obesity epidemic and the chronic health conditions linked to it are causing a change in this approach. Against this backdrop, we conducted our study to evaluate the prevalence of overweight and obesity in the rural field practice area of SIMS, Hapur.

Aim and Objectives

The aim of the study was to find out the prevalence of overweight and obesity among women aged 20 years and above in the rural field practice area of SIMS, Hapur, and to identify the risk factors associated with overweight and obesity in the above study population.

METHODS

This research was conducted within the rural field practice area of SIMS, Hapur, from July 2022 to July 2023, with the study population consisting of women aged 20 years and older who were residents of the SIMS, Hapur field practice area. Excluded from the study were antenatal women during the study period, individuals who remained unreachable after two home visits, those taking chronic medications known to cause weight gain, and uncooperative participants. Study protocol was discussed at the Institutional Ethics Committee and Ethical approval for the study was taken from the Institutional Ethical Committee. Informed written consent was taken from all individual study subjects after explaining the study protocol to the subjects.

To establish the initial household in our sample, we employed a random selection process using a lottery method, where a number within a specific sampling interval was drawn. For instance, in our study, the first randomly selected number was 4, leading us to survey the fourth household. Subsequent households were determined by adding the sampling interval to the initially chosen number, continuing this process until we reached the desired sample size.

Following guidelines from the World Health Organization (WHO), we created a semi-structured questionnaire for data collection. Part 1 of the questionnaire collected socio-demographic information. Part II consisted of questions aimed at gathering data on dietary habits, including daily consumption of cereals, oil, and sugar, as well as the weekly frequency of consuming fruits, vegetables, pulses, milk/milk products, and non-vegetarian items. It also inquired about the type of cooking oil used. Part III focused on physical activity and included details about the duration of household tasks, the nature of one's job, hours spent at work, exercise routines, type and duration of exercise, nightly sleep duration, post-lunch naps, and television viewing time. Respondents were introduced to the study's objectives, and willing participants were interviewed using the questionnaire to collect the necessary information. Afterward, anthropometric measurements were taken and recorded.

The participants' weights were assessed using a portable weighing scale, which remained consistent throughout the study's duration. Participants were directed to stand firmly on the scale's platform, ensuring an even distribution of their body weight between both feet. While taking the measurements, they were permitted to wear lightweight indoor clothing, but they were instructed to remove their shoes or any footwear. To ensure accuracy, the weighing scale was calibrated before each measurement, and routine recalibrations were performed at regular intervals during the study.

RESULT AND DISCUSSION

Among the 500 participants in the study, 52.6% fell within the age group of 20–29 years, while 19.8% were between the ages of 30–39, and only 4.2% were 60 years or older. In terms of religious affiliation, 94.2% of the participants identified as Hindus, while the remaining 5.8% were Muslims. Regarding marital status, 83.2% were married, 7.8% were unmarried, and 9% were either widowed or separated.

In relation to their educational background, 23.8% of the participants had not received any formal education, 18.6% had completed primary school, 24.6% had attended middle school, 24.4% had finished high school, 5.6% had completed higher secondary education, and 3.0% were graduates. The overall literacy rate in the study was determined to be 76.4%. Among the total population, 66.4% were homemakers, while 22.6% were categorized as unskilled workers, 4.6% as semi-skilled workers, 4.8% as skilled workers, and 1.6% as retired or dependent due to old age.

Using the Modified Kuppusamy scale, the study participants were categorized into five socioeconomic classes. The upper-lower class represented 71.6% of the participants, followed by the lower-middle class at 25.4%. The lower class constituted 1.8% of the population, while the upper-middle class accounted for 1.2%.

In the study, there were 500 participants, with 52.6% falling within the age group of 20–29 years, 19.8% in the 30–39 age range, and only 4.2% aged 60 or older. Among the participants, 94.2% identified as Hindus, and the remaining 5.8% were Muslims. In terms of marital status, 83.2% were married, 7.8% were unmarried, and 9% were either widowed or separated.

Regarding their educational background, 23.8% of the participants had no formal education, 18.6% had completed primary school, 24.6% had attended middle school, 24.4% had finished high school, 5.6% had completed higher secondary education, and 3.0% were graduates. The overall literacy rate in the study was 76.4%. Among the total population, 66.4% were homemakers, while 22.6% were classified as unskilled workers, 4.6% as semi-skilled workers, 4.8% as skilled workers, and 1.6% as retired or dependent due to old age.

Using the Modified Kuppusamy scale, the study participants were categorized into five socioeconomic classes. The upper-lower class comprised 71.6% of the participants, followed by the lower-middle class at 25.4%. The lower class made up 1.8% of the population, while the upper-middle class represented 1.2%.

Table 2 displays the associations between age and overweight in the study participants. Among individuals in the 30–39 years age group, the prevalence of overweight was 42.3%. In the 20–29 years age group and among those aged 60 years and older, the prevalence of overweight was approximately 22.1% and 19.05%, respectively. An analysis using the Chi-square test to examine the trend reveals that there is no statistically significant association (p=0.423) between age groups and the presence of overweight.

Overweight was noted in various occupational categories as follows: 26.8% among homemakers, 44% among skilled workers, 31.82% among semi-skilled workers, 22.32% among unskilled workers, and 57.15% among retired individuals and elderly dependents. However, it is worth emphasizing that there was no statistically significant distinction (p=0.071) in the prevalence of overweight across these different occupational groups.

Table 4 offers insights into the relationship between menopause and overweight. It shows that among the participants who had undergone menopause, around 22.67% were classified as obese. On the other hand, for those who had not experienced menopause, the percentage of individuals categorized as obese was slightly higher, standing at 27.53%. After a comprehensive analysis, the findings revealed that there was no statistically significant association (p=0.425) between the prevalence of overweight and the presence of menopause. In other words, the data did not indicate a significant link between menopause and being overweight.

When considering individuals characterized as leading sedentary lifestyles, it was observed that 43.84% of them were overweight. In contrast, among those who were moderately active, 23.93% were overweight, and individuals engaged in vigorous physical activity had a lower prevalence of overweight at 20%. A thorough examination of the data using a Chi-square analysis that analyzed the trend revealed a clear and consistent pattern: As physical activity levels increased from sedentary to vigorous, there was a noticeable and statistically significant decrease in the prevalence of overweight individuals. In fact, the analysis yielded a highly significant p=0.000, emphasizing the

significance of this trend concerning the relationship between physical activity and the prevalence of overweight.

The prevalence of overweight was 42.2% among women who had attained at least a higher secondary level of education, compared to 29.3% among women with no education, and this disparity was statistically significant. This pattern is consistent with the findings of NFHS-3 25, which also reported a higher prevalence of overweight or obesity among women with 12 or more years of schooling in comparison with those with no educational background [7]. Notably, no statistically significant associations were identified between occupation, religion, marital status, family type, and the prevalence of overweight. Similarly, there were no statistically significant correlations found between menopause, personal habits, and the prevalence of being overweight.

An increase in women's socioeconomic status was associated with a notable rise in the prevalence of overweight, and this relationship was statistically significant. Mohan *et al*. [8] reported a 20% prevalence of overweight/obesity among both men and women aged 20 years and older in the low socioeconomic group, while the middle socioeconomic group exhibited a higher prevalence of 35% during the 1996–97 periods.

The prevalence of overweight increased significantly in association with the number of pregnancies (p=0.008). Among individuals with a family history of overweight or obesity, the prevalence of overweight was 53.5%, while those without such a family history had a lower prevalence of 23.6%. This difference was highly significant from a statistical perspective (p=0.000). The presence of a family history of obesity, as noted by the UW Center for Genomics and Public Health Mission, elevates the risk of developing obesity.

As physical activity levels advanced from sedentary to vigorous, there was a corresponding decrease in the prevalence of overweight, and this association was statistically significant (p=0.000). A study conducted by a research group in five cities yielded findings suggesting that sedentary behavior was significantly linked to obesity when compared to non-obese individuals in both genders. This pattern may be attributed to increased economic development in urban areas. In a separate investigation carried out in Jammu, a higher number of obese and overweight individuals were identified among sedentary workers in contrast to those with moderate or intense physical activity, emphasizing the substantial connection between obesity/overweight and levels of physical activity.

In addition, an extended duration of television watching was associated with a higher prevalence of overweight, and this correlation was statistically significant. A study conducted in northern India revealed that women who regularly watched television had an increased likelihood of being overweight and obese in both Delhi and Punjab.

The prevalence of overweight was notably higher at 42.8% among individuals who took a post-lunch nap, compared to those who did not (19.2%). This difference was found to be highly statistically significant (p=0.000). Similarly, the prevalence of overweight was 51.7% for individuals who had <7 h of sleep, and 50% for those who had over 9 h of sleep during the night. This relationship was also statistically significant (p=0.006). A study conducted in Virginia in 2005 revealed that overweight and obese individuals tended to have shorter sleep durations compared to those with normal weight [9]. Another study involving 1.1 million participants established a correlation between an increasing body mass index and habitual sleep durations falling below 7–8 h. In 2002, 39% of adults reported sleeping <7 h/night, and persistent reductions in sleep time have been linked with obesity [10].

The relationship between diet patterns and overweight did not demonstrate statistical significance (p=0.343). However, there was a significant difference in the prevalence of overweight depending on the frequency of fruit consumption. Among those who consumed fruits less than three times a week, the prevalence of overweight

Table 1: Prevalence of overweight and obesity in the study subjects

Nutritional status (BMI)	Number of Individuals	Percentage
Underweight (<18.5)	93	18.6
Normal range(18.5–22.9)	268	53.6
Overweight (> 23):		
At risk (23–24.9)	41	8.2
Obese I (25–29.9)	63	12.6
Obese II (>30)	35	7.0
Total	500	100

Table 2: Associations of age and overweight in the study subjects

Age group	BMI (kg/m^2)		Chi-square value	p
	<23 n (%)	> 23 (Overweight) n (%)		
20–29 years	208 (77.9)	59 (22.1)	0.641	0.423
30–39 years	56 (57.7)	41 (42.3)		
40– 49 years	62 (73.8)	22 (26.2)		
50–59 years	23 (74.19)	8 (25.81)		
≥60 years	17 (80.95)	4 (19.05)		
Total	366 (73.2)	134 (26.8)		

Table 3: Association of occupation and overweight in the study subjects

Occupation	BMI (kg/m^2)		Chi-square value	p-value
	<23 n (%)	> 23 (Over wt) n (%)		
Unskilled worker	87 (77.68%)	25 (22.32%)	8.62	0.071
Semi-skilled worker	15 (68.18%)	7 (31.82%)		
Skilled worker	14 (56%)	11 (44%)		
Homemaker	247 (73.95%)	87 (26.05%)		
Retired	3 (42.85%)	4 (57.15%)		
Total	366 (73.2%)	134 (26.8%)		

Table 4: Association of menopause and overweight

Menopause	BMI (kg/m^2)				Chi-square value	p- value
	<23 n (%)		> 23 (Overweight) n (%)			
yes	58	(77.33%)	17	(22.67%)	0.638	0.425
no	308	(72.47)	117	(27.53%)		
Total	366 (73.2%)		134 (26.8%)			

Table 5: Association of physical activity and overweight

Physical activity	BMI (kg/m^2)		Chi-square value	p-value
	<23 n (%)	> 23 (Overweight) n (%)		
Sedentary	41 (56.16%)	32 (43.84%)	15.78	0.000
Moderate	321 (76.06%)	101 (23.93%)		
Vigorous	4 (80%)	1 (20%)		
Total	366 (73.2%)	134 (26.8%)		

was 29.8%, while it was only 12.7% among those who consumed fruits three times or more per week (p=0.005). A study conducted among urban slum women in Haryana revealed insufficient fruit and vegetable intake. Several studies have confirmed an inverse correlation between fruit consumption and overweight. For instance, research among Spanish adults demonstrated that diets rich in fruits and vegetables were associated with a reduced long-term risk of weight gain and obesity [11].

Factors such as the type of cooking oil used and the consumption of vegetables, pulses, and milk/milk products in relation to overweight were found to be statistically insignificant. However, overweight individuals did have a significantly higher mean intake of cereals, sugar, and oil compared to those who were not overweight (p=0.000). A study involving North Indian women highlighted that those who regularly consumed high-calorie, high-fat foods were more likely to be overweight and obese compared to others [12].

CONCLUSIONS

From our present study, it can be inferred that women with elevated levels of education and socioeconomic status, a family history of overweight, a higher number of pregnancies, sedentary behavior, inadequate sleep, and unhealthy dietary habits face an increased susceptibility to being overweight or obese. To combat the rising rates of overweight and obesity, it is crucial to encourage lifestyle adjustments and adopt a wholesome diet.

CONFLICTS OF INTEREST

No.

AUTHORS FUNDING

No.

AUTHORS CONTRIBUTION

1st author: Brig Dr R K Sehgal, Contribution: Conceptualizing the topic, Designing the aim, objectives, and methodology of the study. Help in data analysis. 2nd author: Dr Vishwanath Ghoshal. Contribution: Data collection and Data entry. 3rd and corresponding author: Dr Ujjwal Sourav. Contribution: Data analysis, paper writing, and literature review.

REFERENCES

1. Lin X, Li H. Obesity: Epidemiology, pathophysiology, and therapeutics. Front Endocrinol. 2021;12(2):706978-83.
2. Willett WC, Koplan JP, Nugent R, Dusenbury C, Puska P, Gaziano TA, *et al*. Prevention of Chronic Disease by Means of Diet and Lifestyle Changes. Disease Control Priorities in Developing Countries. 2nd ed., Vol. 44. Washington, DC: The International Bank for Reconstruction and Development; 2006. p. 1-33.
3. Ginsberg HN, MacCallum PR. The obesity, metabolic syndrome, and type 2 diabetes mellitus pandemic: Part I. Increased cardiovascular disease risk and the importance of atherogenic dyslipidemia in persons with the metabolic syndrome and type 2 diabetes mellitus. J Cardiometab Syndr. 2009;4(2):113-9.
4. Darusman F, Rusdiana T, Sopyan I. Bioequivalence of metformin as an oral antidiabetic: A systematic review. Int J Appl Pharm. 2023;15(6):76-81.
5. Catalano PM, Shankar K. Obesity and pregnancy: Mechanisms of short term and long term adverse consequences for mother and child. BMJ. 2017;356(2):j1.
6. Justyn M, Yulianti T, Wilar G. Long-term covid-19 effect to endothelial damage trough extrinsic apoptosis led to cardiovascular disease progression: An update review. Int J Appl Pharm. 2023;15(6):60-8.
7. Misra A, Pandey RM, Devi JR, Sharma R, Vikram NK, Khanna N. High prevalence of diabetes, obesity and dyslipidaemia in urban slum population in northern India. Int J Obes Relat Metab Disord. 2001;25(11):1722-9.
8. Mohan V, Shanthirani S, Deepa R, Premalatha G, Sastry NG, Saroja R, *et al*. Intra-urban differences in the prevalence of the metabolic syndrome in southern India -- the Chennai Urban Population Study (CUPS No. 4). Diabet Med. 2001;18(4):280-7.
9. Knutson KL, Van Cauter E. Associations between sleep loss and increased risk of obesity and diabetes. Ann N Y Acad Sci. 2008;1129:287-304.
10. Haster G, Busysee DJ, Klaghofer R, Gamma A, Ajdacic V, Eich D, *et al*. The association between short sleep duration and obesity in young adults: 13 year prospective study. Sleep. 2004;27(3):661-6.
11. Yadav K, Krishnan A. Changing patterns of diet, physical activity and obesity among urban, rural and slum populations in north India. Obes Rev. 2008;9(2):400-8.
12. Agrawal P, Mishra V, Agrawal S. Covariates of maternal overweight and obesity and the risk of adverse pregnancy outcomes: Findings from a nationwide cross sectional survey. J Public Health. 2012;20:387-97.